EDITORIAL

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Year's comments for 2008

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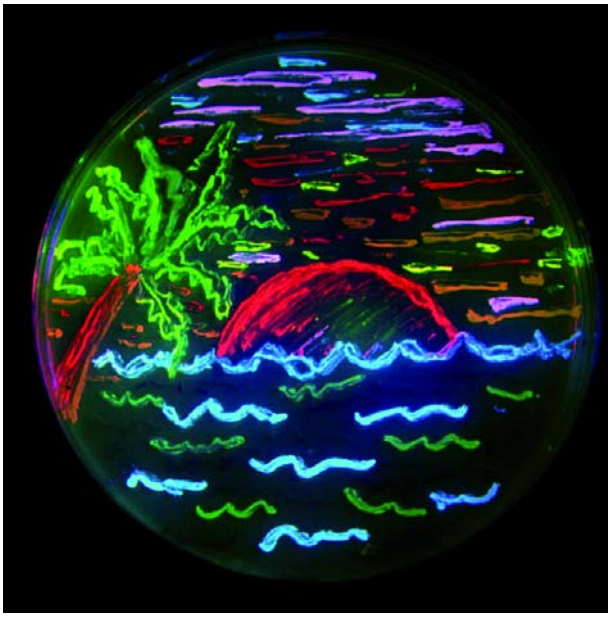
When commenting on the year's achievements and news in microbiology, we often refer to the Nobel Prizes, which are the most prestigious science awards worldwide. In 2008, microbiology was the subject of two of the Prizes. Harald zur Hausen, from the German Cancer Research Centre (Heidelberg, Germany), was awarded half of the Nobel Prize in Physiology or Medicine "for his discovery of human papilloma viruses causing cervical cancer." The other half went to Françoise Barré-Sinoussi, from the Institut Pasteur (Paris, France) and Luc Montagnier, from the World Foundation for AIDS Research and Prevention (Paris, France), "for their discovery of human immunodeficiency virus." The Nobel Prize in Chemistry was shared by Osamu Shimomura, from the Marine Biological Laboratory (MBL), Woods Hole (MA, USA), and Boston University Medical School (MA, USA), Martin Chalfie, from Columbia University (New York, NY, USA), and Roger Y. Tsien, from the University of California San Diego and Howard Hughes Medical Institute (CA, USA), "for the discovery and development of the green fluorescent protein, GFP." The observation of Shimomura and colleagues, in 1962, of GFP in the *Aequorea victoria* jellyfish [J Cell Comp Physiol 59:223-239 (1962)], has become a powerful tool to study proteins in living organisms.The lines that make up the drawing in Fig. 1 are bacterial colonies expressing different fluorescent proteins: blue fluorescent protein (BFP), monomeric teal fluorescent protein 1 (mTFP1), Emerald, Citrine, and mOrange. It was created at Tsien's laboratory by Nathan Shaner.



Source: Wikimedia Commons

Fig. 1. A San Diego beach scene drawn with an eight-color palette of bacterial colonies expressing fluorescent proteins derived from green fluorescent protein (GFP) and the red-fluorescent coral protein dsRed. (Artwork by Nathan Shaner; photography by Paul Steinbach.)

From time to time, controversy about the unfair distribution of some of the Nobel Prize arises. In 2008, all of the Nobel Prizes awarded in science were sources of controversy, including ethical questions about the way in which they were awarded. Let us refer only to the two above-mentioned awards, even though controversy also followed the announcement of the Physics prize. The Nobel Prize in Physiology or Medicine finally recognized the discovery of HIV, especially the role played by Barré-Sinussi in the virus' identification. She was, in fact, the first author of the 1983 article that described the virus. Outside the circle of specialists, however, who knew that a woman had co-discovered HIV? Moreover, by awarding the prize only to Barré-Sinussi and Montagnier, the Nobel Foundation took sides

with the French team in their long-running dispute with the USA researcher Robert Gallo and his team regarding the priority of the discovery of HIV. After a long debate, Gallo finally accepted, in a letter to *Nature* [Nature 351:358 (1991)], that the cultures from which the virus was isolated in his laboratory apparently had been contaminated with the French virus received from the Institut Pasteur. The decision of the Nobel Foundation, perhaps not unexpectedly, was coldly welcomed in the USA, but this was also the case in France, albeit for another reason: many researchers believe that Jean-Claude Cherman, who had co-authored the 1983 article describing the virus and signed the patent applications derived from its discovery, should have been granted a share of the prize.

Controversy also accompanied the awarding of the other half of the Nobel Prize in Physiology or Medicine. It has been said that when the winners were announced, Colombian-born physician Nubia Muñoz, now living in France, was congratulated—not on the prize, which she had not been awarded, but on the epidemiologic studies that she had carried out while at the International Agency for Research on Cancer in Lyon (France). That work established the relationship between human papilloma virus infection and cervical cancer—a discovery that zur Hausen received credit for. The situation became even further complicated, placing the integrity of the Nobel Foundation at stake, after it was made public that a member of the jury was also a member of the board of AstraZeneca, a multinational pharmaceutical company that produces two vaccines against papilloma virus infection.

Regarding the Nobel Prize in Chemistry, the award failed to recognize someone who had played a key role in the development of the GFP technique. In 1987, MBL biochemist Douglas Prasher realized the potential of the jellyfish glowing protein to be used as a tracer. He successfully cloned the cDNA coding for the *Aequorea* GFP, sharing with Martin Chalfie several patents for its applications. However, Prasher was not granted any share of the Nobel Prize. In fact, he had been forced to leave research science in 2006, when the NASA mission for which he worked was closed down. He now works in Huntsville, Alabama—the site of a NASA Space Flight Center, whose first director was Wernher von Braun—but no longer with NASA as his boss. Instead, he works for Toyota as a shuttle-van driver for the company's customers. When the Prize was announced, Chalfie recognized Prasher's contribution, and he and Roger Y. Tsien sponsored the attendance of Prasher and his wife at the Nobel Prize ceremony.

Among the many discoveries in microbiology over the last few decades is the finding of the presence of life in rocks at the Earth's deep subsurface, where organisms cannot derive energy from the sun, neither directly nor indirectly, as is the case for deep-sea biota. In 2008, another equally surprising discovery was made in this same type of environment. The environmental genomics study of samples collected at 2.8-km depth in a South African gold mine yielded the single, complete genome of an uncultured microorganism that has been named *Candidatus* Desulfurodis audaxviator [Chivian et al. (2008) Environmental genomics reveals a single-species ecosystem deep within Earth. Science 322:275-278]. Based on the genomic analysis, it can be assumed that the microorganism is a rod-shaped, motile, sporulating, sulfate-reducing, chemoautotrophic thermophile bacterium, and that it fixes its own nitrogen and carbon by using archaean machinery. Thus, the bacterium must have acquired the archaean genes by horizontal gene transfer prior to becoming isolated in its habitat. This finding shows that a single genome can encode all the biological information needed for the functioning of a simple ecosystem.

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In 2008, the scientific community lost several scientists who greatly contributed to modern microbiology: Joshua Lederberg (1925–2008), Harlyn O. Halvorson (1925–2008), and Norbert Pfennig (1925–2008). Joshua Lederberg, who was Raymond and Beverly Sackler Foundation Scholar, at The Rockefeller University, was awarded half the Nobel Prize in Physiology or Medicine in 1958, when he was just 33, "for his discoveries concerning genetic recombination and the organization of the genetic material of bacteria." Along with the astrophysicist Carl Sagan, Lederberg established a new field of research that he called exobiology (now astrobiology). On the occasion of the 50th anniversary of the publication of *The Microbe's Contribution to Biology*, by A.J. Kluyver and C.B. van Niel, Lederberg contributed to INTERNATIONAL MICROBIOLOGY with an Editorial about the role that Kluyver and van Niel had played in the development of modern microbiology [Lederberg J (2006) *The Microbe's Contribution to Biology*—50 years after. Int Microbiol 9:155-156].

Harlyn Odell Halvorson, Woods Hole Marine Biological Laboratory Director Emeritus and the Director of the Policy Center for Marine BioSciences and Technology at the University of Massachusetts at Boston, headed the American Society for Microbiology (ASM) from 1976 to 1977 and had been a member of the Editorial Board of INTERNATIONAL MICROBIOLOGY. He was a pioneer in the molecular genetics of *Bacillus subtilis*, *B. cereus*, and *Saccharomhyces cerevisiae*, following the path of his father, Halvor Orin Halvorson,

who also had been a great microbiologist and president of the ASM, from 1954 to 1955 [Halvorson HO (1997) Two generations of spore research: from father to son. Microbiología SEM 13:131-148]. Despite the strained relations between the USA and Cuba, in 1982 Halvorson and a group of North-American and Cuban scientists launched the North-American/Cuban Scientific Exchange (NACSEX), aimed at establishing scientific exchange mainly in the biosciences [see Halvorson HO (1996) Instituciones de apoyo a la microbiología en Cuba. Microbiología SEM 12:343-346],

Norbert Pfennig was professor of limnology and microbial ecology at the University of Konstanz, Germany, from 1979 to 1990. His name, along with that of his collaborator Klaus D. Lippert, is linked to a specific medium that allows not only the growth of phototrophic purple and green sulfur bacteria, which are usually very difficult to grow, but also their isolation. Pfennig discovered the importance of vitamin B_{12} in the cultivation of these bacteria. He considered van Niel his teacher, and it was at van Niel's laboratory in Pacific Grove, California, that Pfennig deepened his understanding of phototrophs and began his collaboration with Germaine Cohen-Bazire and Roger Y. Stanier.

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In addition to our retrospective vision of the year that has ended, we wish to mention several activities due to take place in 2009. INTERNATIONAL MICROBIOLOGY has joined the many institutions that are celebrating the bicentennial of Charles Darwin's birthday and the sesquicentennial of the publication of his book *On the Origin of Species*. In fact, we started our celebration already in the September 2008 issue, with an article on the Linnean Society and the July 1, 1858 meeting at which the papers of Darwin and Wallace were presented [Guerrero R (2008) The session that did not shake the world. Int Microbiol 11:209-212]. In addition, a map of the Galapagos Islands was featured on the cover of that issue of the journal. The current issue features another article, by Sir Crispin Tickell, devoted to Darwin and evolution, this time as seen 150 years after the publication of Darwin's seminal work [see pp. 283-288, this issue].

Through its numerous courses of action, in 2008 the Spanish Society for Microbiology strengthened its links with Latin American microbiology, by joining the Latin American Association of Microbiology (Asociación Latinoamericana de Microbiología; ALAM). INTERNATIONAL MICROBIOLOGY has long supported Latin American microbiology by publishing a significant number of articles from authors or coauthors working in Latin American laboratories and reports on ALAM meetings [Seeger M, Espinoza MF (2008) Highlights of Latin American Microbiology: the 19th ALAM Congress. Int Microbiol 11:289-292, this issue]. In addition, since 2004, the journal has recognized the work of Latin American microbiologists of the past by honoring several of them on its back cover [Chica C (2008) Microbiology in Latin America and the ALAM. Int Microbiol 11:213–220].

Impact factors (IF) from ISI-Thomson Scientific for a given year are made public at the Journal Citation Reports of the following year. In June 2008, we were informed that the 2007 INTERNATIONAL MICROBIOLOGY IF had increased to 2.617, with the journal thus ranking higher than in previous years in the ISI-Thomson lists of Microbiology and Biotechnology & Applied Microbiology journals. In 2008, 250 manuscripts were submitted to the journal. The four issues published during the year consisted of 30 articles (Research Articles, Research Notes, and Reviews), seven complements (Editorials and Perspectives), adding up to 320 pages. The articles were authored by teams working in Spain, Brazil, Ecuador, France, Germany, Mexico, Portugal, and the United Kingdom.

The success of a journal depends on many factors, one of which is the efficiency of peer reviewers. Once again, we thank those researchers who devoted part of their time to reviewing manuscripts received by INTERNATIONAL MICROBIOLOGY. In many cases, their comments greatly contributed to improving the original manuscript. Even if a manuscript is not accepted for publication, reviewers' comments can be of help to authors, informing them of flaws in their work and ways to avoid them in the future. The names of most of the reviewers that have collaborated with the journal during 2008 are listed on p. 302 of this issue. We must also thank the authors that have considered this open-access journal for publishing their works, as well as the wide readership. When scientific journals tend to be more and more specialized, INTERNATIONAL MICROBIOLOGY has tried to deal with microbiology as an integrative discipline, not only regarding the various microbial groups, but also publishing different kinds of articles, from notes on methods to research articles, and reviews on selected topics, as well as in different subfields including medical microbiology, bioremediation, microbial ecology, genomics and proteomics, and the history of microbiology. In addition, we think that science must not have borders of any kind, let alone economic ones. The Open Access Initiative, which this journal has always supported, is among the greatest projects to contribute to a better world, in which scientific knowledge should be part of the Global Commons.